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ENERGY AND MINERAL SECTORS IN CONTEXT

Energy and Resource
Policy Division
Department of Finance

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PREFACE

The purpose of this document is to review the role of the energy and mineral sectors in the economy and to review, using some macro-economic indicators, the performance of the two sectors, relative to the economy as a whole and other sectors.

Highlights

GDP

- The energy sector's contribution to GDP was \$7.6 billion (\$ 1971) in 1984 or about 6% of total GDP, relatively unchanged from 1983.
- The mining sector showed a substantial improvement in 1984 with GDP at \$6.5 billion, accounting for 5.2% of total GDP compared to 4.8% in 1983. The mining sector has not, however, recovered to its peak of \$7.1 billion in 1980.

Employment

- The energy sector accounted for 273,000 direct employees or 3.1% of the total in the first quarter of 1985. This excludes those employees engaged in the drilling service sector. Energy sector employment has grown only marginally (2%) since the second quarter of 1983. By contrast, the wholesale and retail trade component of energy has shown substantial growth at 10%.
- The mineral sector accounted for 379,000 employees or 4.3% of total employees in the first quarter of 1985. Total employment in the sector has declined by 27,000 employees or 6.6% since the second quarter of 1983. In particular, metal fabricating and non-metallic mineral fabricating have shown the largest declines, while "other mining" and wholesale mineral products have registered increases in the number of employees.

Capital Expenditures

- The energy sector's capital expenditures at \$21 billion in 1984 were the single largest component of total capital expenditures of \$100.5 billion. Within the energy sector, investment in upstream oil and gas surpassed investment in electricity for the first time.
- In 1984, mineral sector capital expenditures were \$5.9 billion, 20% over 1983 levels and showing recovery from the recession induced low in that year. Expenditures still have a long way to go to return to the 1981 level of \$7.5 billion.

Exports and Imports

- The energy sector in 1984 recorded a trade surplus of \$8.9 billion, a 16.4% increase over 1983. Increases in crude oil exports and coal exports accounted for most of the growth in the trade balance.
- The mineral sector showed a record trade surplus of \$7.9 billion in 1984. Both crude minerals and fabricated materials increased their export sales substantially, but crude minerals contributed more to the increase in the trade surplus as imports in that sector did not increase as greatly as in the fabricated material sector.

A DEFINITION OF THE ENERGY AND MINERAL SECTORS

In order to assess the energy and mineral sectors it is necessary to have a comprehensive definition of each of the sectors. Statistics Canada, the basis for most of the data in this document, has adopted an activities based focus for data aggregation. There are no mineral or energy sectors as such in Statistics Canada data. Instead, the components of the energy and mineral sectors are classified variously under mining, manufacturing, transportation, utilities and trade. However, these categories are sufficiently disaggregated to allow the selection of the energy and mineral related components and to compose reasonable definitions of both the energy and mineral sectors. For this study we have included mineral and energy commodities, (e.g., crude oil, iron ore) and related activities (e.g., extraction, manufacturing, trade) to the extent that they involve mineral and energy commodities directly. The major components of the two sectors as we have defined them are listed below. (A more detailed breakdown of the sectors and a description of the components is provided in Appendix I-A and I-B.)

Energy Sector

Statistics Canada Generic Classification

Crude Petroleum and Natural Gas
Coal Mines
Petroleum Refineries
Misc. Petroleum & Coal Products
Pipelines
Gas Distribution
Electric Power
Wholesale Petroleum Products
Retail Gasoline Outlets

Mining
Mining
Manufacturing
Manufacturing
Transport. & Utilities
Transport. & Utilities
Transport. & Utilities
Wholesale Trade
Retail Trade

Mineral Sector

Statistics Canada Generic Classification

Metal Mines (incl. Uranium)
Non-Metal Mines
Other Mining (incl. Services to
Mining)
Primary Metals
Metal Fabrication
Non-Metallic Mineral Products
Wholesalers of Metal & Metal Products


Mining
Mining
Mining
Manufacturing
Manufacturing
Manufacturing
Wholesale Trade

The definition of the energy sector was tempered by the availability of data. For example, uranium, as an energy commodity, should be included in the energy sector, but since Statistics Canada classifies it as a component of metal mines and does not provide separate statistics for uranium in all cases, it was not possible to include it as part of the energy sector. Other omissions from the energy sector dictated by the lack of data include "contract drilling for petroleum" and "services to drilling", which are included in the mineral sector as sub-components of the "other mining" category. "Geological and geophysical work", which should be divided and included in both the energy and mineral sectors, is not included in either sector as it is classified under the general heading "Engineering and Scientific Services" and no separate data are provided.

In developing the energy sector definition, it was decided to exclude the petrochemical industry. While it could be argued that perhaps the primary petrochemical industry (which produces products such as ethylene which require further processing) should be included in the energy sector, there is a problem with data availability. Statistics Canada does not provide separate categories for the primary petrochemical industry and the secondary industry, which produces finished manufactured products such as paints or plastics. Because the secondary petrochemical industry is very large and does not produce energy commodities, it was decided to exclude it to avoid a distortion of our analysis of the energy sector.

The mineral sector was easier to define. It includes the production of metals and non-metals and the manufacturing activities, both primary and secondary associated with these raw materials. There is no specific retail trade sector associated with the mineral sector, but mineral and mineral product wholesalers are included.

In all cases, where the Statistics Canada generic classifications are used for comparative purposes, the classifications have been altered to exclude data which we have included in our definitions of the energy and the mineral sectors (see Appendix I-C for a detailed description of this adjustment). For example, when we refer to the Statistics Canada retail trade group in this study, it no longer includes gasoline service stations.



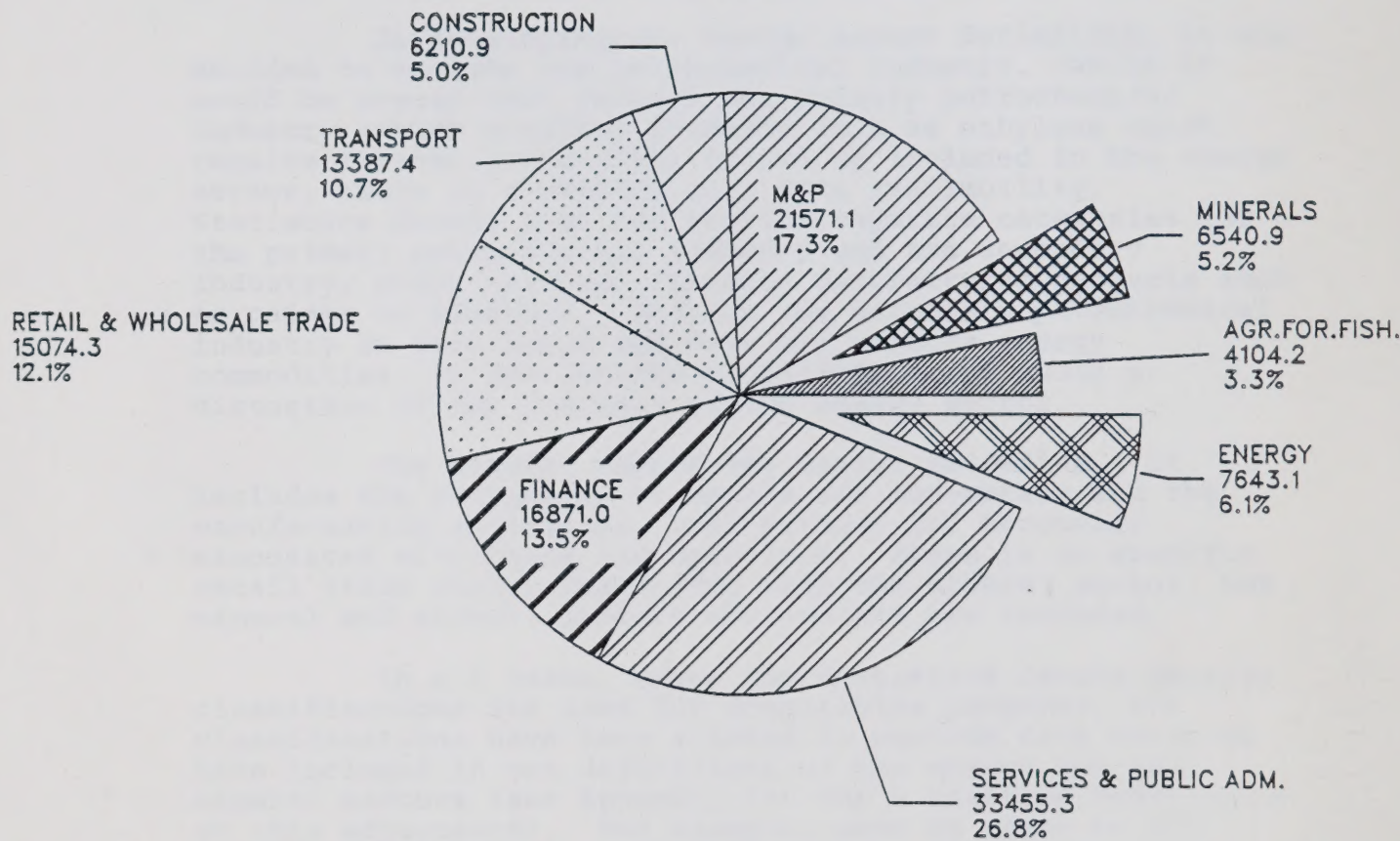
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<https://archive.org/details/31761115553638>

GRAPH 1 GROSS DOMESTIC PRODUCT MILLIONS DOLLARS (1971 DOLLARS)

TOTAL: 124.8 BILLIONS

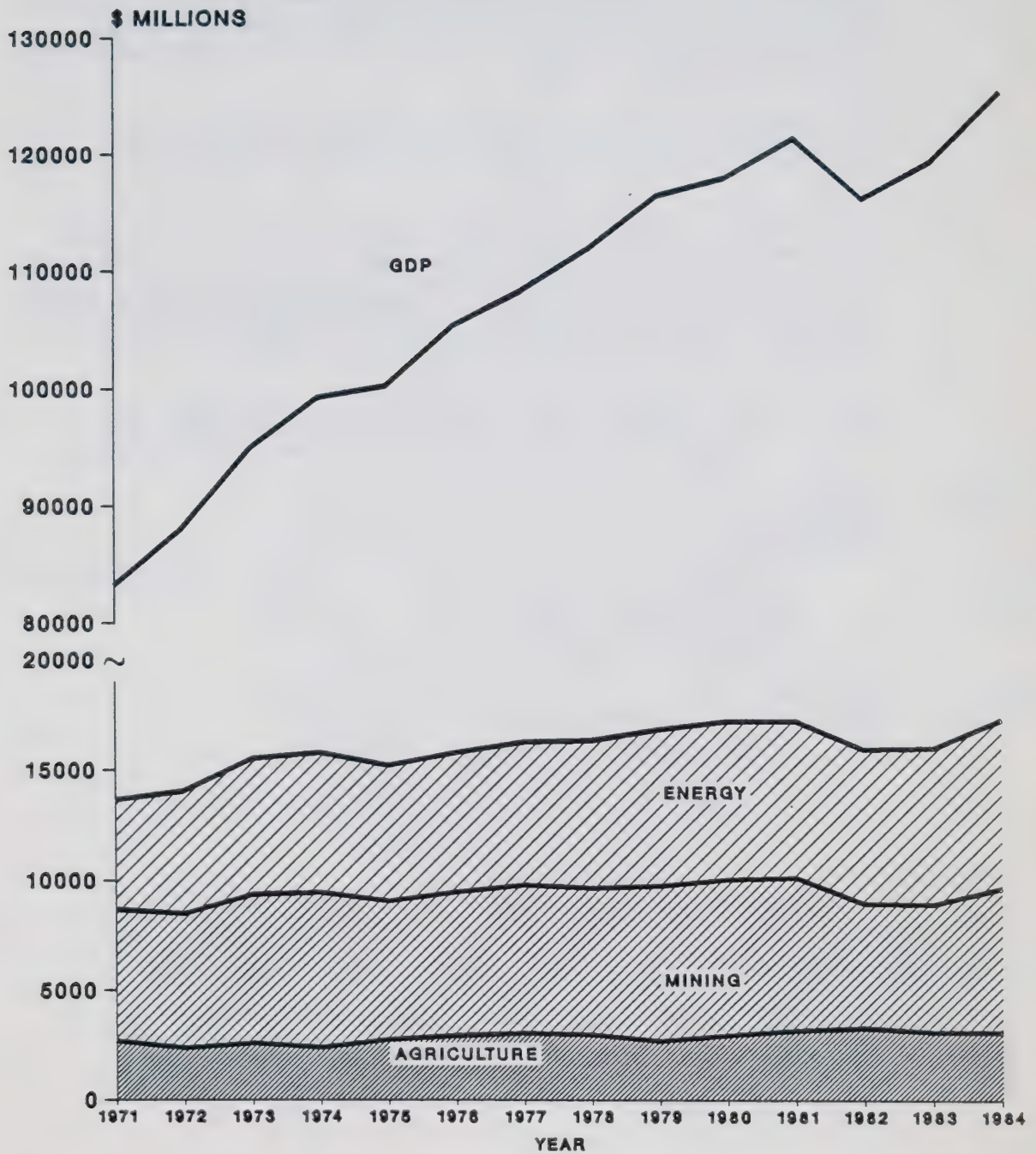
1984



1984 GDP
(\$1971)

- Total 1984 GDP, measured in \$1971, was \$124.8 billion. Total GDP in 1984 increased by 4.9% from 1983, and reached a level slightly higher than the previous high level achieved in 1981.
- The energy and mineral sectors make a significant contribution to total GDP together accounting for over 11%.
- Energy GDP, at \$7.6 billion, represents 6.1% of 1984 GDP measured in \$1971. This represents only about one third of manufacturing GDP but the energy sector makes the largest contribution to GDP of all the resource sectors - almost twice as large as agriculture, forestry and fishing put together.
- The mineral sector, with \$6.5 billion of real GDP in 1984, is the second largest of the resource sectors.

GRAPH 2
GROSS DOMESTIC PRODUCT
(1971 DOLLARS)

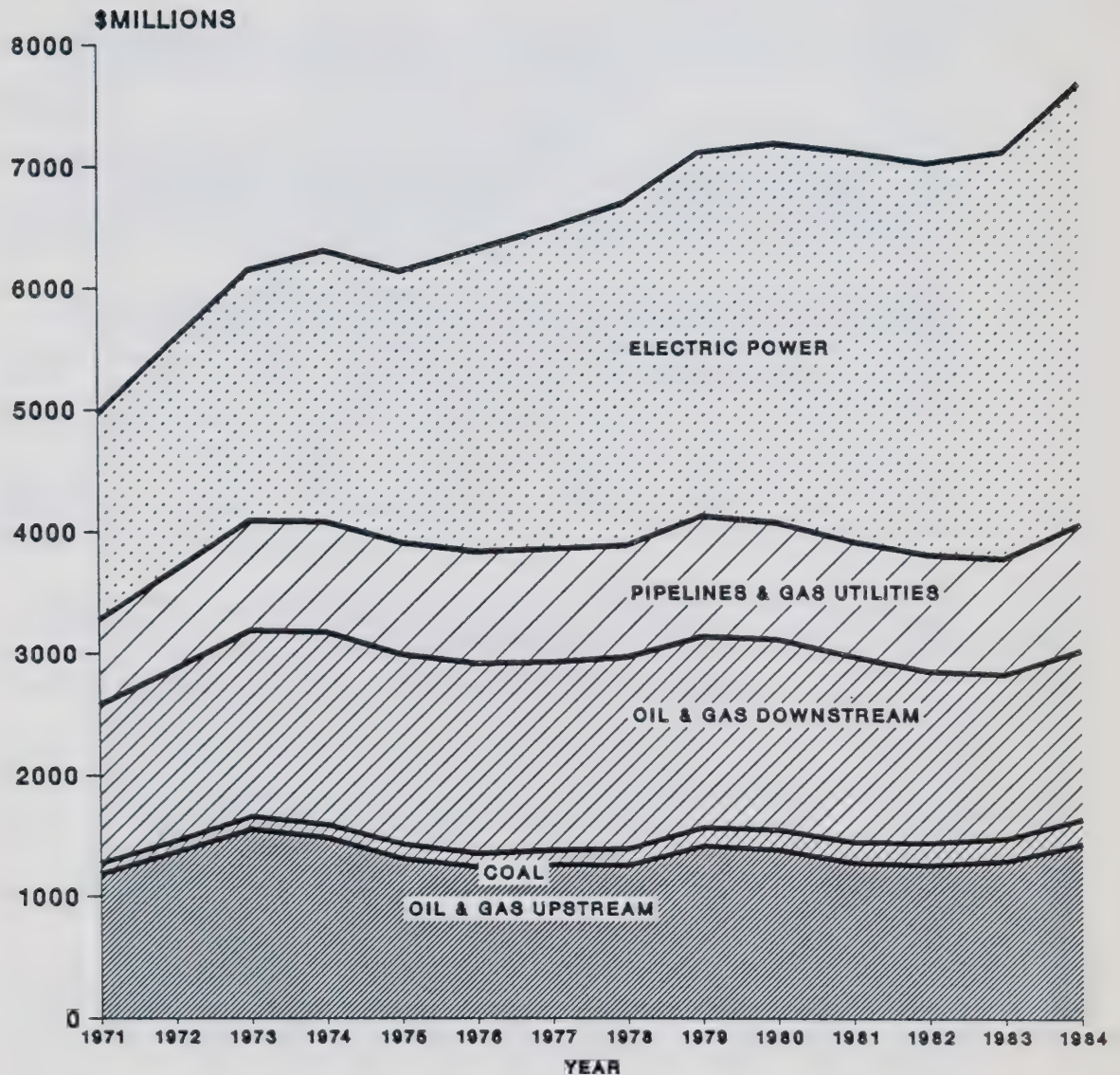


GDP 1971-84
\$1971

- In analysing over time the growth of the economy as measured by GDP, constant 1971 dollars are used such that real growth can be established. As different sectors of the economy may experience different inflation rates, a constant dollar analysis also allows for inter-sectoral comparisons which are not distorted by inflation rates.
- Between 1971 and 1984, total real GDP grew 48.8%; a growth in GDP was recorded each year in this period except for 1982 when GDP fell by 4.2%.
- The mineral sector greatly underperformed the economy as a whole between 1971 and 1984 with growth of only 9%, while the energy sector marginally outperformed the economy as a whole with growth of 53.8%.
- The relative contribution of the mineral sector has been declining over time. Mineral sector GDP has remained relatively constant in real dollar terms (in the range of \$5.5 billion to \$6.9 billion) in the period 1971-84, at a time when total GDP has increased to \$125 billion from \$83 billion. Therefore, the mineral sector's share of real GDP has eroded from 7.1% in 1971 to 4.8% in 1983. 1984 marked a turnaround with the sector's share of real GDP increasing to 5.2%.
- During the 1981-82 recession, the energy sector fared much better than the economy as a whole. The energy sector experienced only a 1.4% decline in real GDP in 1982 from 1981, compared to a 4.2% decline for the economy as a whole. Unlike the rest of the economy, energy sector GDP was not at a high level in 1981, due in part to the decision by Alberta to shut-in crude oil production in response to the federal government's imposed pricing regime. Therefore, the decline in 1982 was less severe. However, when 1982 energy GDP is compared to 1980 GDP (the highest level achieved in the pre-1981 period), the decline is still only 2.4%.
- The mineral sector, on the other hand, was particularly hard hit by the recession; GDP decreased by 18.7% from 1981 to 1982, the largest decline of any sector in the economy. A general decline in demand, both domestically and internationally, combined with falling commodity prices, accounted for the sector's poor performance.

GRAPH 3 GROSS DOMESTIC PRODUCT ENERGY SECTOR

(1971 DOLLARS)

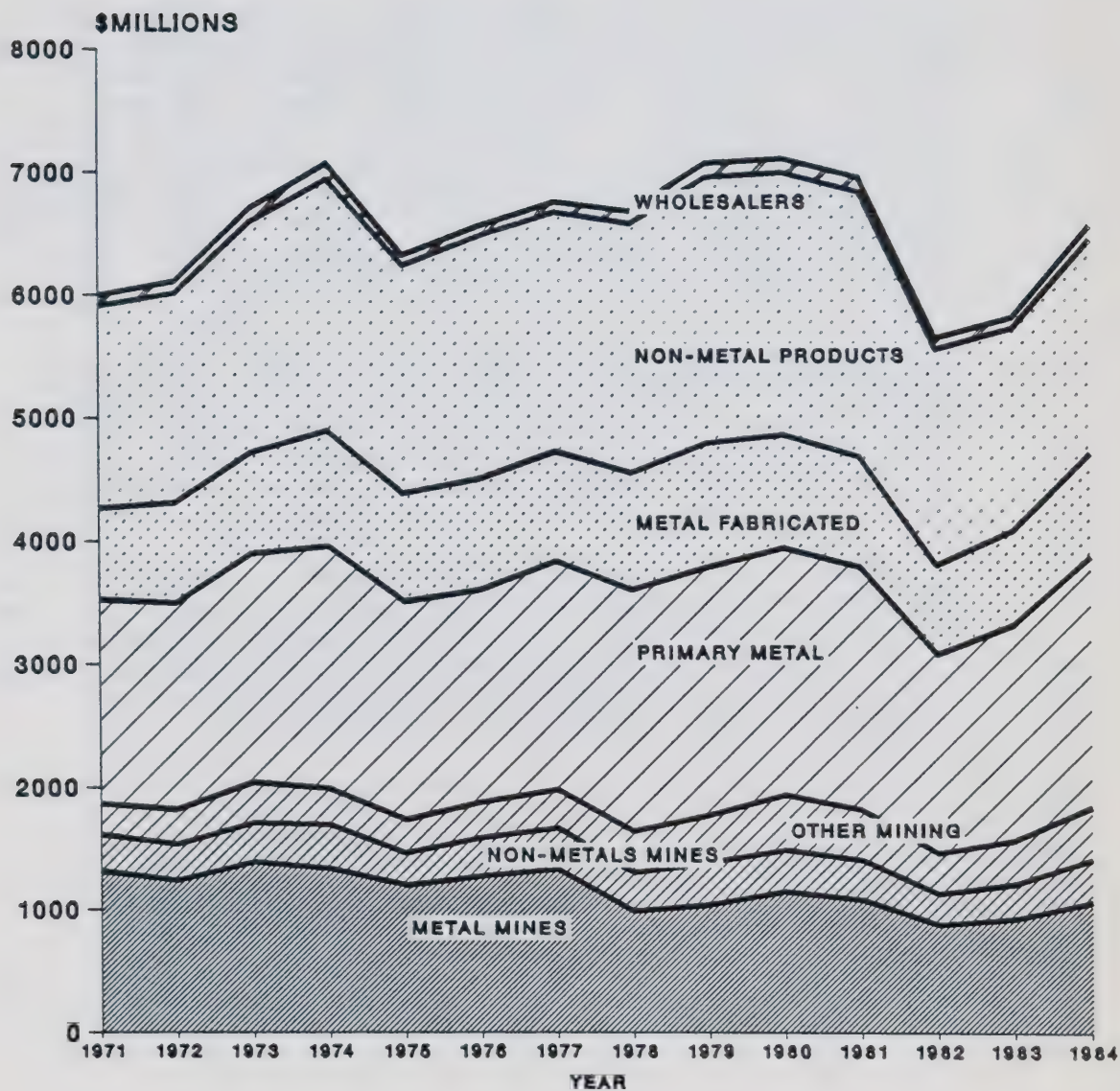


ENERGY SECTOR
1971-84 GDP
\$1971

- Energy sector GDP is dominated by electricity. In 1971, electricity's share of the sector's GDP was 34%, 32% greater than upstream oil and gas; by 1984, electricity accounted for 47% of total energy GDP, 150% greater than upstream oil and gas.
- The upstream oil and gas industry's real GDP in 1984 was \$1.4 billion, or 19% of energy sector GDP, which is about the same as the downstream segment of the industry. However, the upstream segment has been subject to greater fluctuation due to the 1973 and 1979 oil price increases. Upstream GDP increased from \$1.2 billion in 1971 to \$1.6 billion in 1973, declined over time to about \$1.2 billion in the period 1976-1978 and increased to \$1.4 billion in 1979. Since 1979, upstream GDP declined to \$1.3 billion in 1983 and showed a moderate increase to \$1.4 billion in 1984.
- The downstream sector's real GDP has been declining since 1974 due to the overall decline in petroleum product demand, starting with the first (1973) oil price increase and increasing with the second (1979). In 1974, the downstream sector accounted for 25% of total energy GDP; by 1984 this had declined to 18%.
- The pipeline and gas utilities industries' real GDP has remained fairly constant in the period 1971-1984. Some increase was recorded in 1984 due to the expansion of natural gas transportation systems in Eastern Canada as a result of increased demand for gas due to oil conservation and substitution measures.

GRAPH 4 GROSS DOMESTIC PRODUCT MINERAL SECTOR

(1971 DOLLARS)



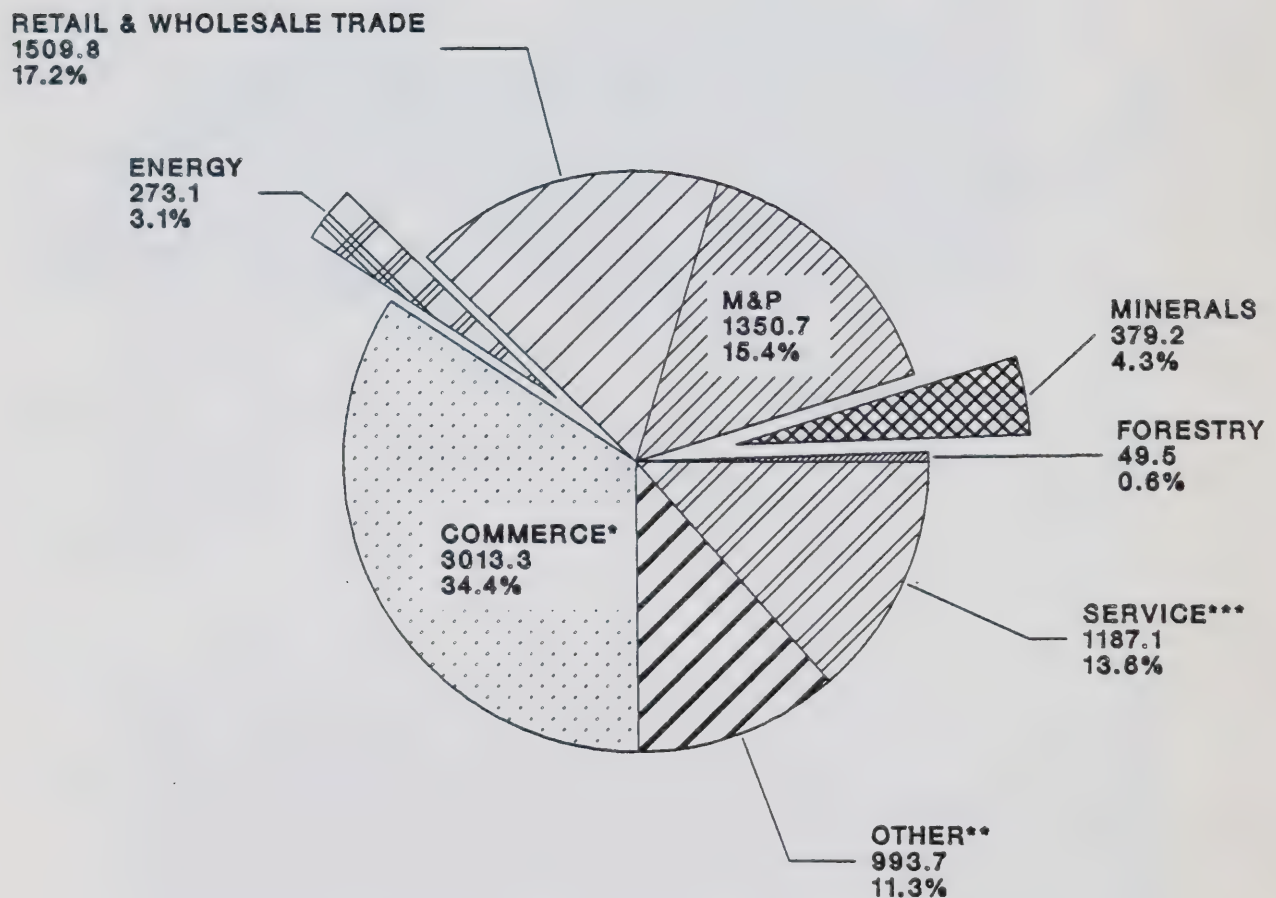
MINERAL SECTOR GDP
1971-84

(\$ 1971)

- The mineral sector has remained relatively static over the period 1971-1984. With the exception of 1982, total mineral GDP has been in the range of \$6.0 to \$7.0 billion.
- Even within the sector, there have been no dramatic shifts in the relative importance of various sub-sectors. Mineral sector GDP is dominated by the manufacturing sub-sectors; primary metals, metal fabricating and non-metallic products accounted for 70% of 1984 GDP, approximately the same proportion as in 1971.
- Services to mining has shown the greatest growth in the period 1971-1984, increasing by just over 100% attributable largely to the increase in contract drilling for oil and gas which is included in this category. Wholesaling of mineral products registered the second largest growth rate at 32%. Other sectors showed modest growth in GDP over the period with the exception of metal mines which decreased by 19%.

**GRAPH 5
ESTIMATED EMPLOYMENT BY SECTOR
FIRST QUARTER 1985
(THOUSANDS)**

TOTAL: 8,756,400 EMPLOYEES



* COMMERCE IS BUSINESS, PERSONAL SERVICE (I.E., EDUCATION, HEALTH, SOCIAL AND PROFESSIONAL SERVICES)

** OTHER INCLUDES CONSTRUCTION, TRANSPORT, COMMUNICATION AND UTILITIES

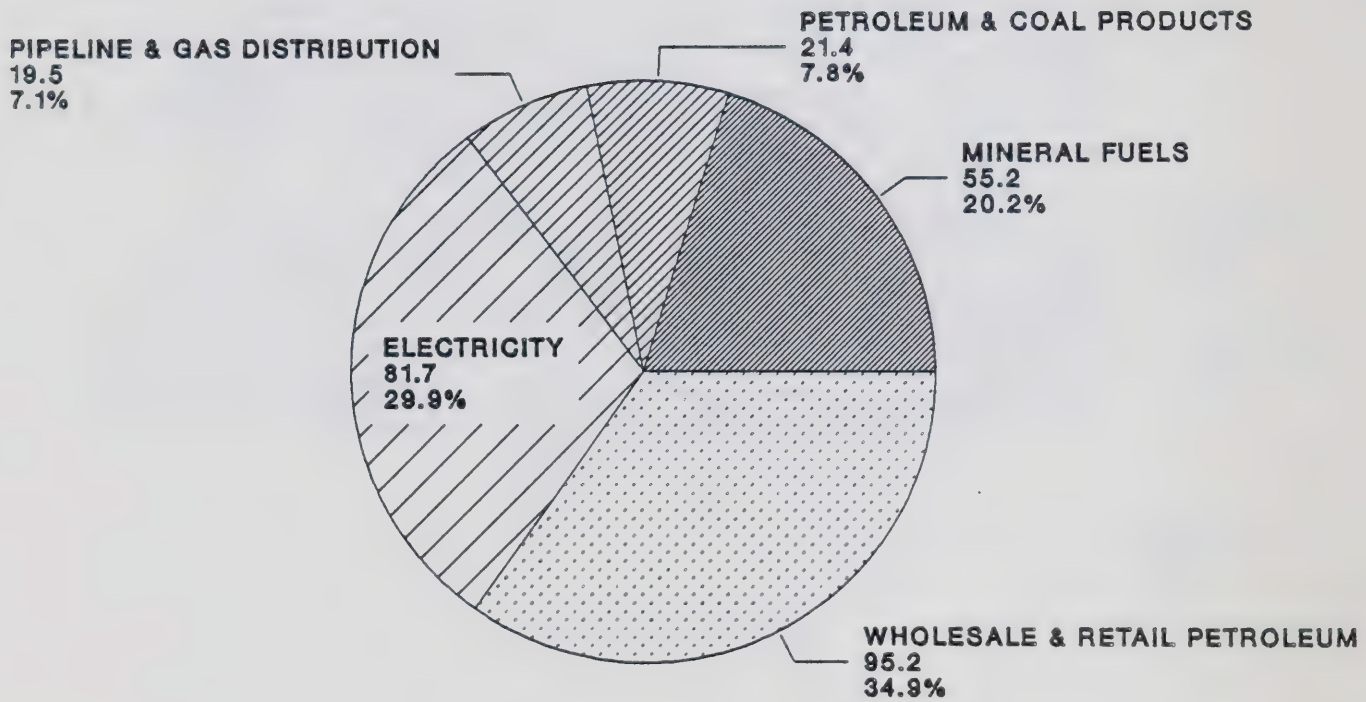
***SERVICE INCLUDES FINANCE, INSURANCE AND REAL ESTATE, AND, PUBLIC ADM.

FIRST QUARTER 1985 EMPLOYMENT
NUMBER OF EMPLOYEES

- For the first quarter 1985, the number of employees in Canada, as measured by industrial aggregate employment, totalled 8.7 million. Industrial aggregate employment includes all employees in Canada including governments and public administration but excluding agriculture, fishing and household service. In January 1985, there were approximately 810,000 Canadians employed in agriculture, fishing and household service, and there were also approximately another 1.15 million Canadians who were self-employed. These persons are not included as employees in the industrial aggregate statistic, such that the industrial aggregate represents approximately 92% of all employees and 82% of all persons employed.
- Canadian employment is dominated by the labour intensive service sectors; retail and wholesale trade, commerce and service accounted for 65.2% of total employees. The manufacturing sector is the largest of the industrial sectors and accounts for only 15% of total employees.
- The mineral and energy sectors, being relatively capital intensive, employ only a small proportion of the industrial aggregate number of employees; in the first quarter of 1985, there were 379,000 employees in the mineral sector and 273,000 employees in the energy sector. Together the two sectors accounted for 7.4% of total employees in the industrial aggregate.

GRAPH 6
ESTIMATED EMPLOYMENT IN THE ENERGY SECTOR
FIRST QUARTER 1985
(THOUSANDS)

TOTAL: 273,000 EMPLOYEES

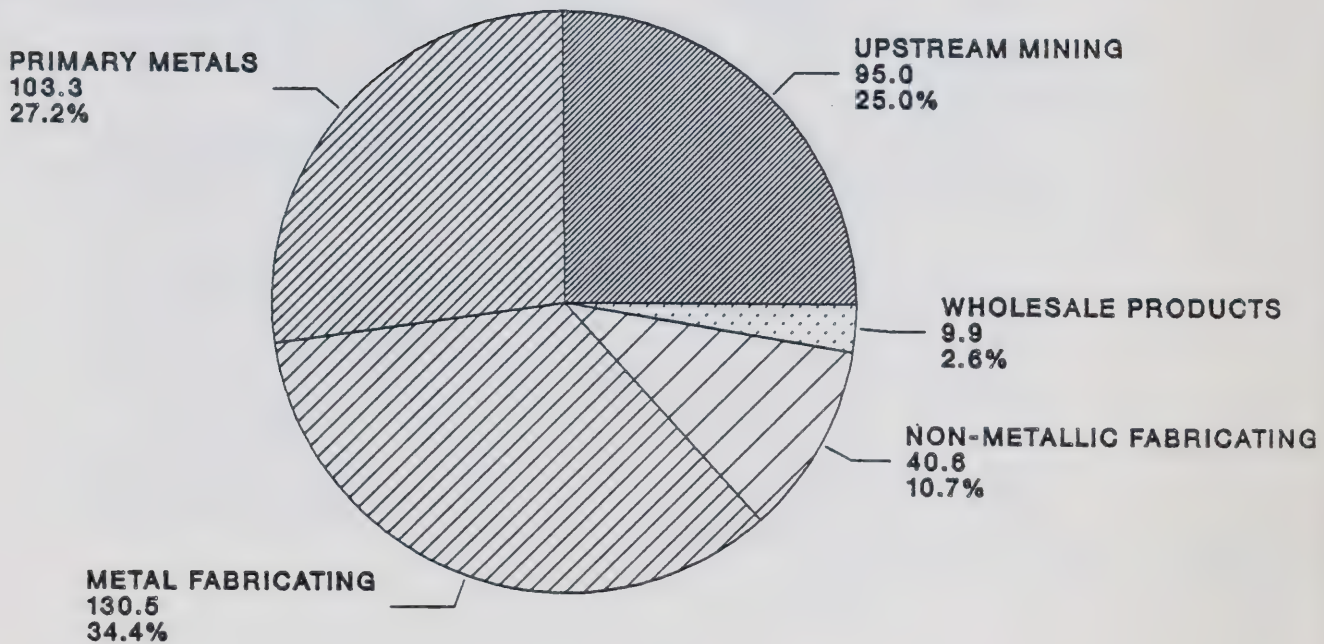


ENERGY EMPLOYMENT
FIRST QUARTER 1985

- As in the economy as a whole, energy sector employment is dominated by the "service" sector; 35% of total energy employment (representing 95,000 employees) is in the wholesale and retail trade side of the sector. Of those engaged in wholesale and retail trade, two thirds are employed in retailing petroleum products.
- Wholesale and retail trade is the only subcomponent which experienced substantial employment growth since the second quarter of 1983; employment has increased by 8.5%. All other energy subcomponents, with the exception of mineral fuels, which showed a growth of 5.7%, have shown modest declines in employment.
- Electricity is the second largest subcomponent representing 30% of total employment. Mineral fuels ranks third at 55,000 persons or 20% of the energy total; upstream oil and gas comprises 80% of mineral fuels employment and coal mines 20%. While it is commonly thought that the upstream segment of oil and gas accounts for much of energy employment, it is interesting to note that direct employment in this sector is only 44,000. This, however, does not include persons employed in the drilling services industry.
- The petroleum and coal products sector employed about the same number of persons as pipelines and gas distribution together, about 20,000 persons, each just over 7% of the total. Petroleum and coal products employment has declined by 10% since the second quarter of 1983, the largest decline in the energy sector. This is due in part to the closing of refineries which has occurred as a result of the declining demand for petroleum products and the ensuing rationalization of the refining industry.

GRAPH 7
ESTIMATED EMPLOYMENT IN THE MINERAL SECTOR
FIRST QUARTER 1985
(THOUSANDS)

TOTAL: 379,300 EMPLOYEES



MINERAL SECTOR EMPLOYMENT
FIRST QUARTER 1985

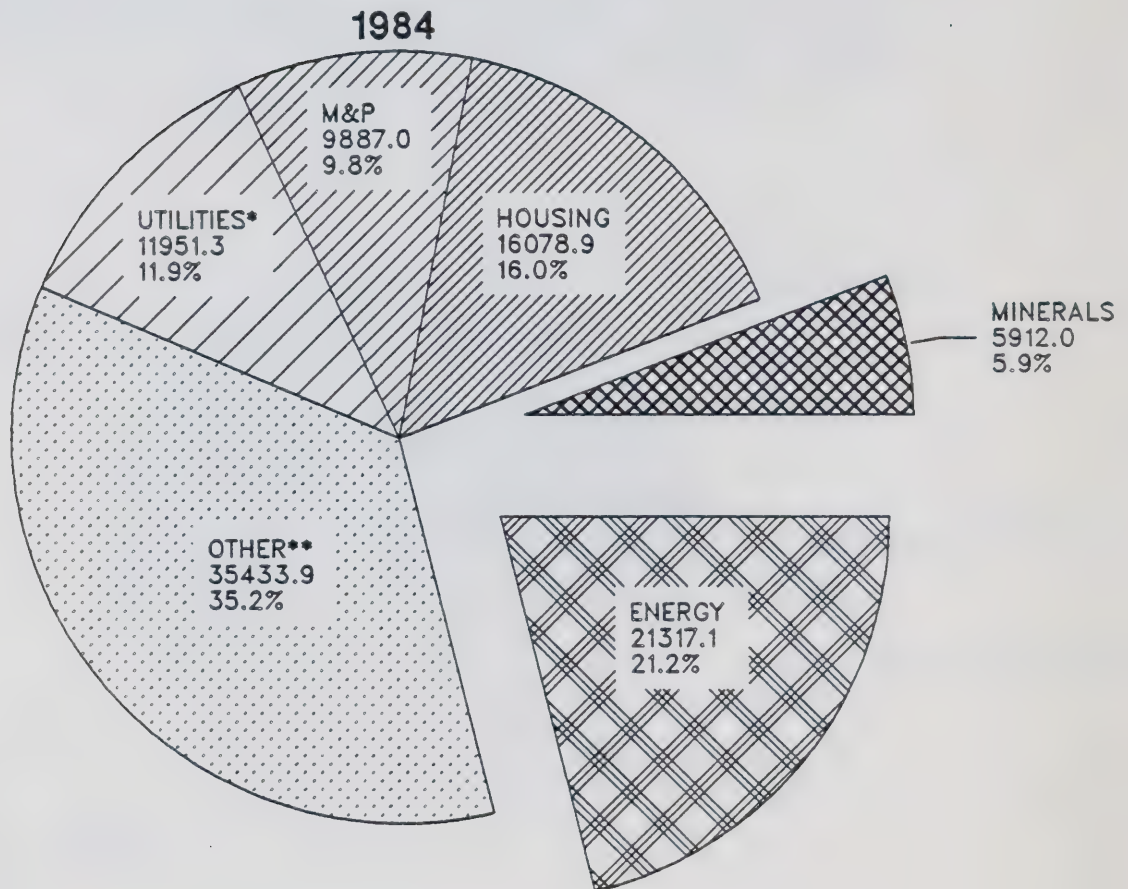
- Approximately one-quarter of mineral sector employment is in upstream mining and three-quarters is in the processing and fabricating of mineral products.
- Metal fabricating represents the largest employment component of the mineral sector with 34% or 130,000 employees of the total of 379,000 mineral sector employees.
- The primary metals component is the next largest with just over 100,000 employees, approximately 27% of the mineral sector total; close behind is upstream mining with 95,000 employees.

GRAPH 8

CAPITAL EXPENDITURES BY SECTOR

(MILLIONS DOLLAR)

TOTAL: \$100.6 BILLIONS



* UTILITIES INCLUDE TRANSPORT, GRAIN TERMINAL, COMMUNICATION AND WATER DISTRIBUTION
-BUT PIPELINES, GAS DISTRIBUTION AND ELECTRICAL UTILITIES ARE INCLUDED IN ENERGY

** OTHER INCLUDES AGRICULTURE, FORESTRY, CONSTRUCTION, TRADE, FINANCE, INSURANCE AND REAL ESTATE,
SERVICES, INSTITUTIONS AND GOVERNMENT DEPARTMENTS

CAPITAL EXPENDITURES

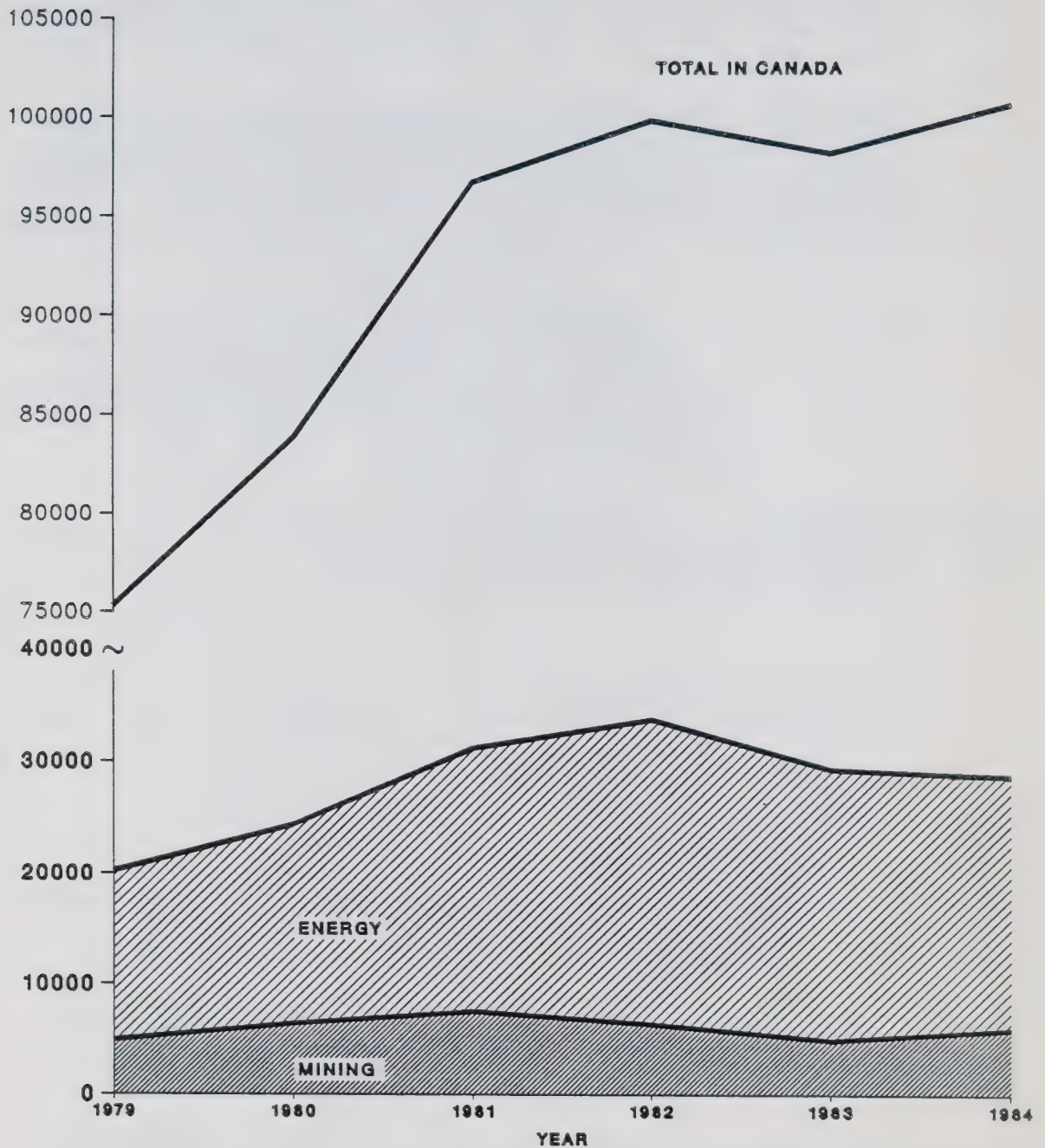
1984

CURRENT DOLLARS

- Total public and private sector capital expenditures in 1984 were just over \$100 billion, an increase of 2.5% over 1983.
- The energy sector is a very capital intensive sector. While it accounted for only 3% of employees, it is the largest single sector in the Canadian economy in terms of capital expenditures, accounting for 21% of expenditures. Total spending was \$21 billion, over 40% more than housing, the next largest sector.
- The mineral sector accounted for a relatively small proportion of total capital expenditures, about 6% or \$6 billion. Mineral sector capital expenditures are comparable in size to those of the agricultural sector, and are ten times larger than capital expenditures in the forestry sector.

GRAPH 9 CAPITAL EXPENDITURES

(MILLIONS DOLLARS)



CAPITAL EXPENDITURES

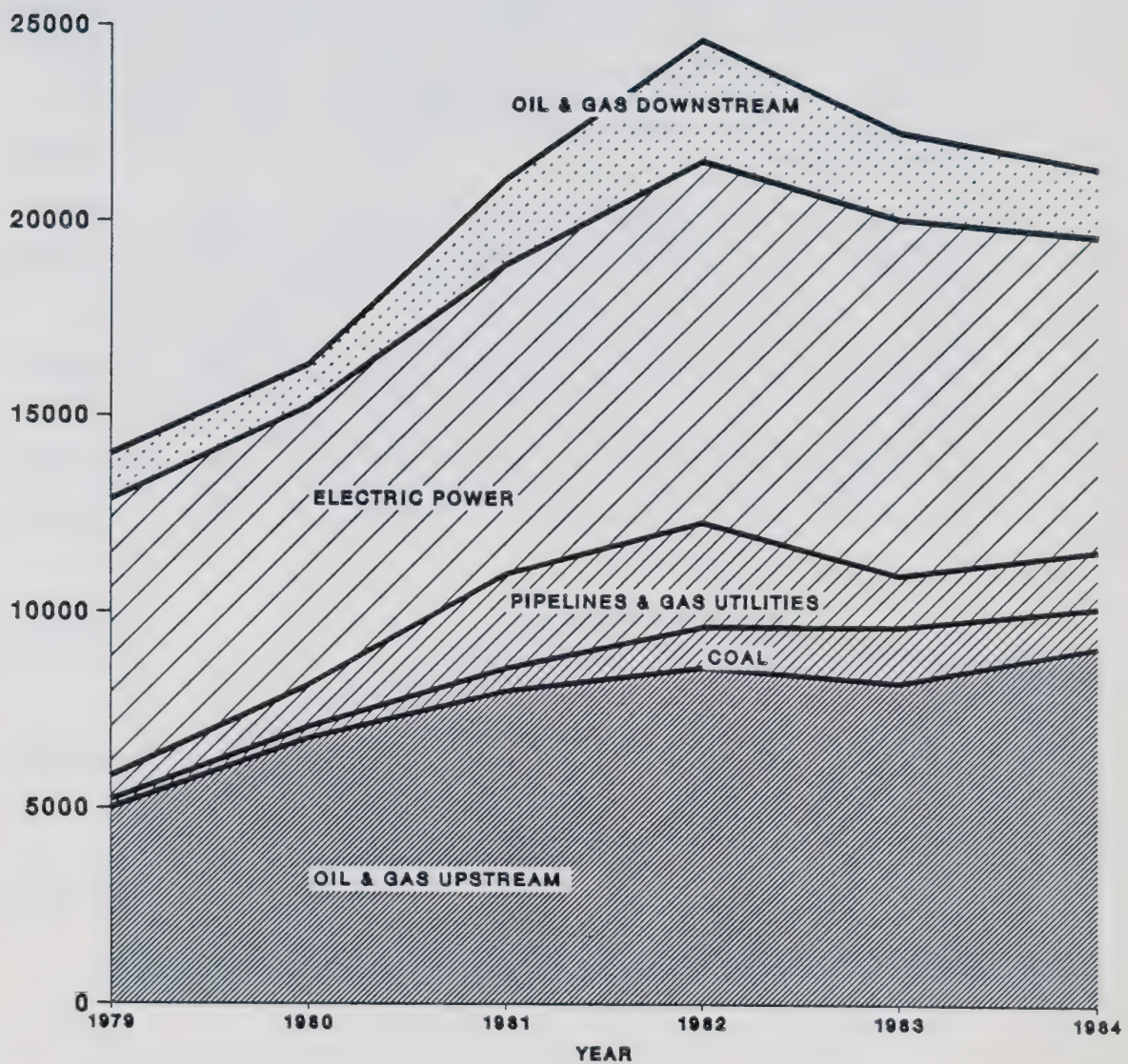
1979-84

CURRENT DOLLARS

- When measured in current dollars, total capital expenditures have increased steadily (with a minor decline in 1983), from \$75 billion in 1979 to over \$100 billion in 1984, to register growth of 33.5%.
- In the period 1979-1984, the energy sector increased its capital expenditures by 55%, from \$13.7 billion to \$21 billion. Its relative share of the total increased from 18.2% in 1979 to 21.2% in 1984. Only the energy sector, the service sector and the utilities sector (defined to exclude energy utilities) grew faster in this period than the average growth in capital expenditures.
- Mineral sector capital expenditures increased by 20% between 1979 and 1984 to reach almost \$6 billion; however, the sector did not keep pace with overall growth in capital expenditures as its share of the total declined from 6.5% in 1979 to 5.9% in 1984. Mineral sector capital expenditures were more severely affected by the recession than other sectors; in 1981, the mineral sector had record expenditures of \$7.5 billion or 7.7% of capital expenditures, whereas at the low point in 1983, capital expenditures had dropped to \$4.9 billion or 5.0% of the total.

GRAPH 10 CAPITAL EXPENDITURES ENERGY SECTOR

MILLIONS DOLLARS



OIL & GAS DOWNSTREAM INCLUDES PETROLEUM REFINERIES,
PETROLEUM & COAL PRODUCTS AND GASOLINE STATION

ENERGY CAPITAL EXPENDITURES

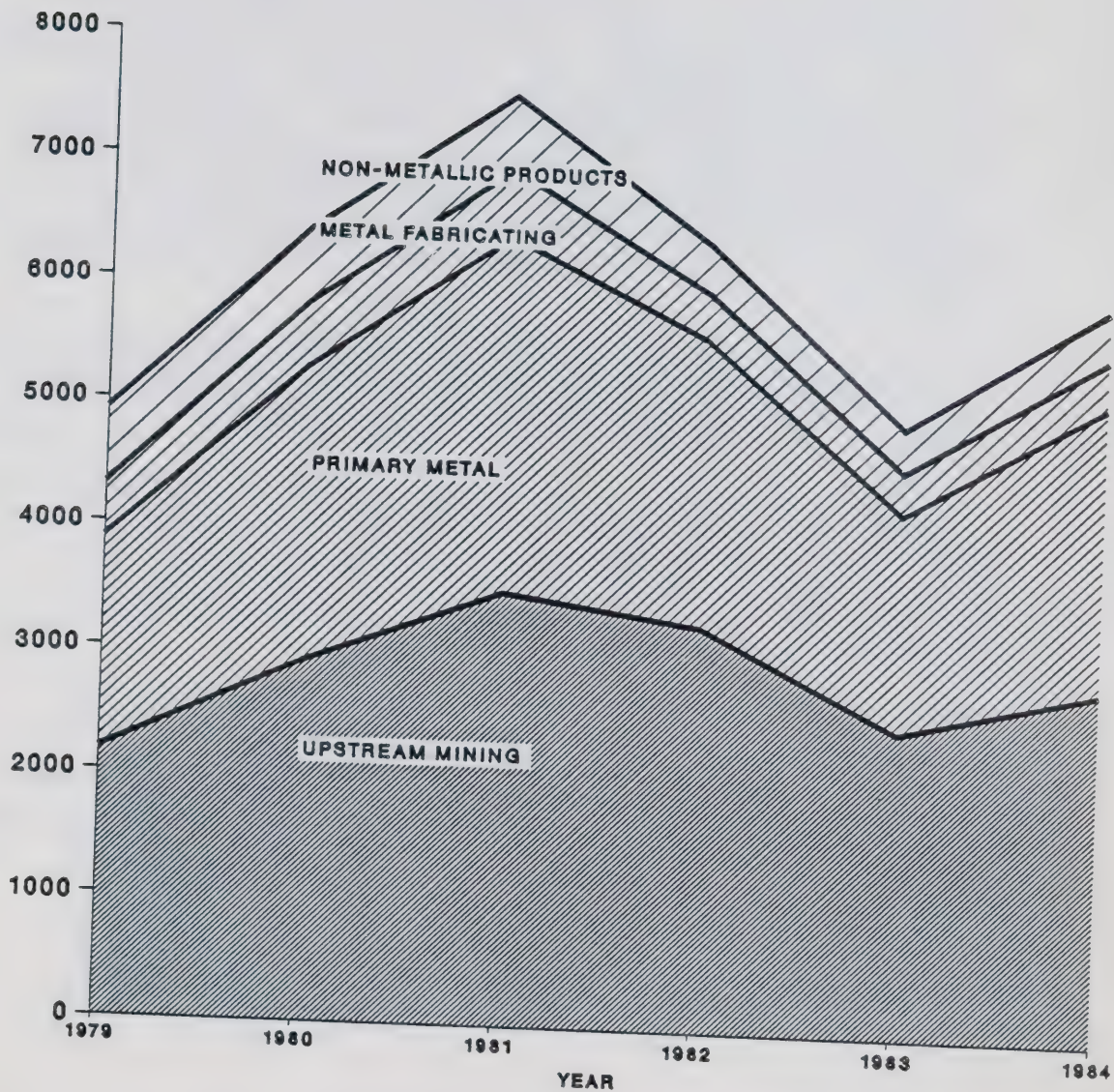
1979-84

CURRENT DOLLARS

- Overall energy sector capital expenditures rose steadily from 1979 to 1982 to reach a high of \$24.6 billion in that year. Since the peak year, capital expenditures have declined by 13.5% to \$21.3 billion in 1984.
- Electricity capital expenditures have typically represented the largest component of energy sector capital. However, over the period 1979 to 1984, electricity's share of the sector total has been declining (from 52% in 1979 to slightly under 39% in 1984) at the same time as upstream oil and gas capital investment has been increasing. Electricity capital investment has declined as several large electric projects, including James Bay hydro development and Ontario Hydro nuclear stations development, have been completed.
- In 1984, for the first time, upstream oil and gas capital expenditures surpassed those of the electricity sector. Upstream oil and gas capital expenditures reached a record high of \$9 billion in that year.
- The pipeline sector experienced extremely rapid growth in 1981 and 1982, because of gas pipeline construction connected with the pre-build portion of the Alaska Highway gas pipeline. Expenditures increased from \$311 million in 1979 to over \$2 billion in 1982 but tapered off to \$800 million in 1984.
- Coal mining, while a small component of the overall energy total, has shown a large increase in investment from \$214 million in 1979 to \$1.4 billion in 1983, due in part to the construction of the Quintette mine in British Columbia. In 1984, however, investment declined to \$1 billion.

GRAPH 11 CAPITAL EXPENDITURES MINERAL SECTOR

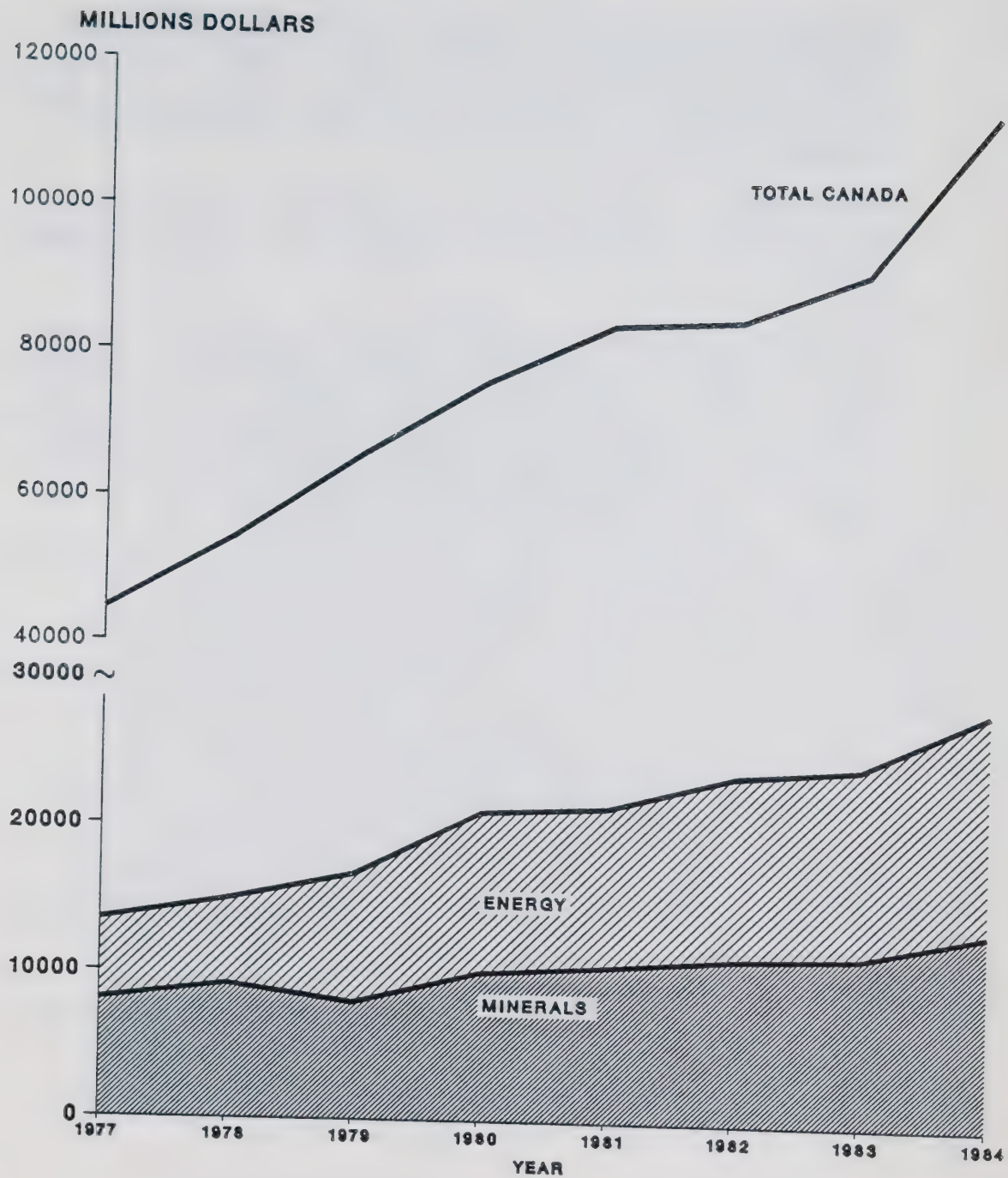
MILLIONS DOLLARS



MINERAL CAPITAL EXPENDITURES
1979-84

- While the mineral sector was severely affected by the 1981-82 recession, capital expenditures did not register a large decline until 1983. This is due to the inherent lag in capital investment where investment decisions cannot always be immediately reversed when economic conditions deteriorate.
- Total capital investment in the mineral sector was \$5.9 billion in 1984, an increase of 20% over 1983 but substantially less than the record \$7.5 billion in 1981.
- Unlike the energy sector, the upstream mineral sector has traditionally been the largest component of mineral sector capital expenditures, accounting for 48% of the total or \$2.8 billion in 1984. Upstream mining followed the trend of the sector as a whole with expenditures increasing slightly over 1983 levels but showing a substantial decline from the high of \$3.5 billion in 1981.

GRAPH 12 EXPORTS

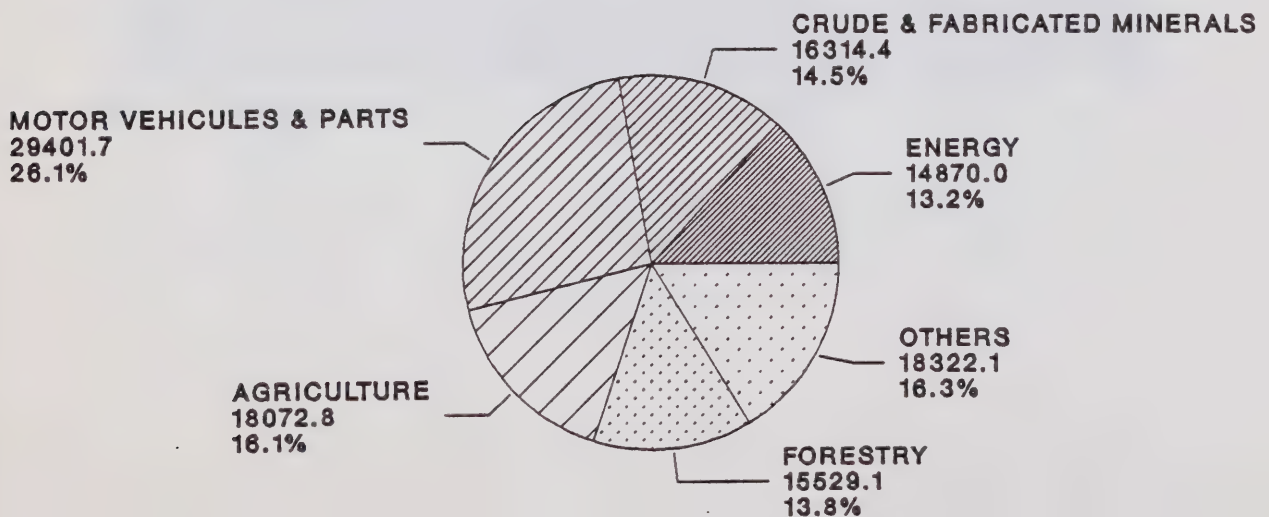


Exports
1977-1984

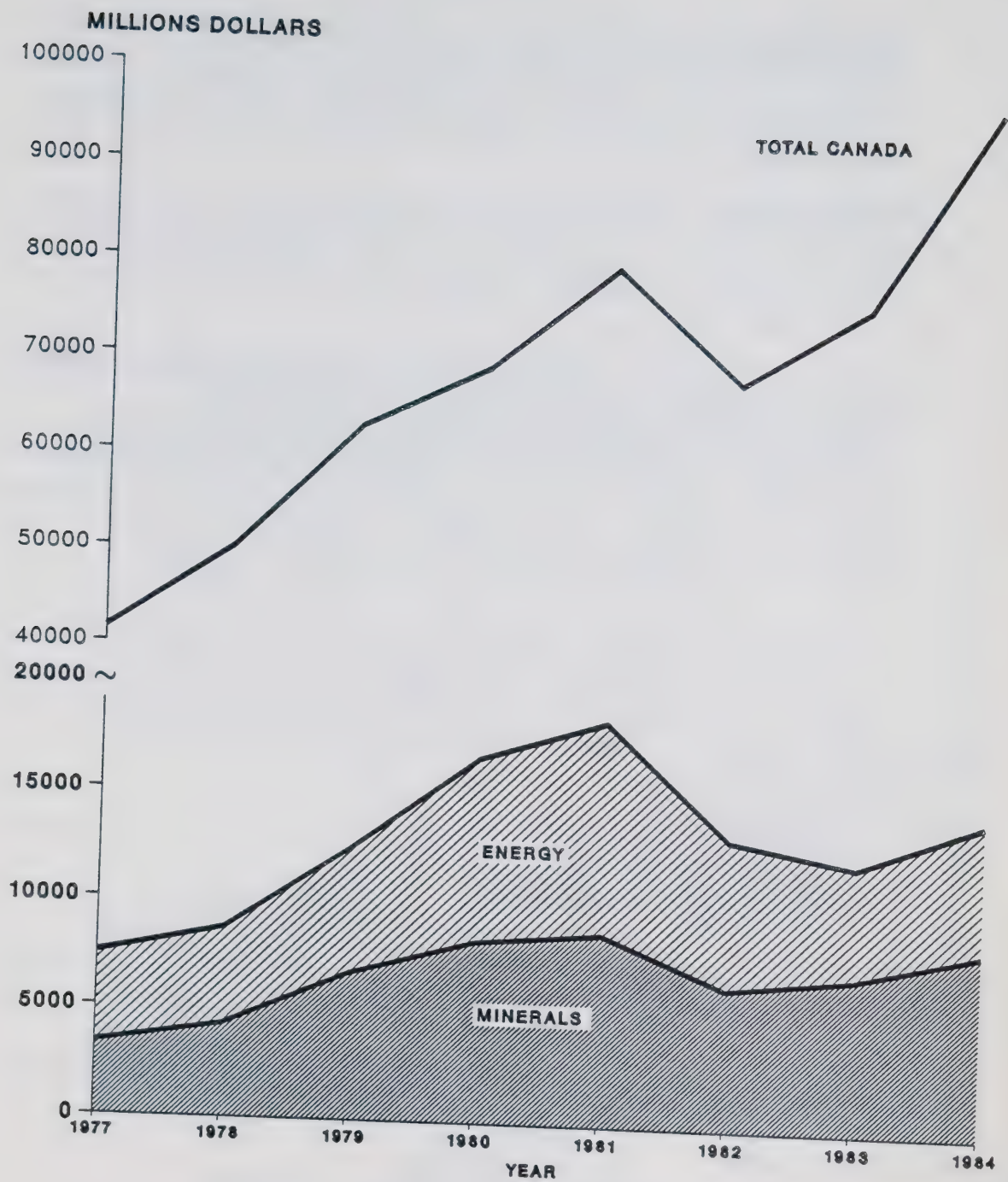
- Between 1977 and 1984, total Canadian exports grew by more than 150%, from \$44.5 billion in 1977 to \$112.5 billion, including re-exports, in 1984. Throughout the period, Canada has recorded a positive trade balance which was \$16.6 billion in 1984, up 8% from 1983.
- Energy sector exports grew by almost 175% in the same period, from \$5.4 billion to \$14.9 billion, outpacing the increase in total exports; its relative share of total exports increased from 12.2% in 1977 to 13.2% in 1984.
- While the mineral sector accounts for more exports than the energy sector, with exports rising from \$8.1 billion in 1977 to \$16.3 billion in 1984, its relative importance has been declining over the period. The mineral sector did not match the export growth of the energy sector or of the economy as a whole in this period. Mineral exports grew by about 100% and the sector's relative share of total exports showed a decline from 18.2% in 1977 to 14.5% in 1984.
- Forestry and motor vehicle parts and accessories were larger export earners than energy. Energy exports, however, were greater than those of the agricultural sector. In terms of contribution to the positive trade balance, energy was surpassed only by the forestry sector.

**GRAPH 12
EXPORTS IN 1984
(MILLIONS DOLLARS)**

TOTAL: 112,510.1



GRAPH 13 IMPORTS



Imports
1977-1984

- Between 1977 and 1984, total Canadian imports grew by more than 130 per cent from \$41.5 billion in 1977 to \$95.8 billion in 1984.
- Energy sector imports have shown substantial fluctuation. Between 1977 and 1979, imports were relatively stable, in the \$4-5 billion range. In 1980, imports increased to \$8.4 billion and in 1981 reached a record \$9.7 billion, partly due to the shut-in of Alberta crude oil production in that year which caused Eastern Canadian refiners to purchase crude oil from foreign sources and partly due to the price increases over the period 1979-81. Since 1981, imports have decreased and were \$5.9 billion in 1984.
- The mineral sector has seen less fluctuation and growth in imports. It represented 7.9% of total Canadian imports in 1977 and 8.7% in 1984.

**GRAPH 13
IMPORTS IN 1984
(MILLIONS DOLLARS)**

TOTAL: 95,842.4

MOTOR VEHICLES & PARTS
25709.6
26.8%

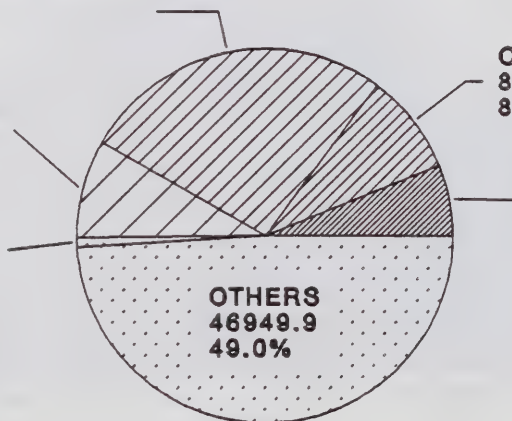
AGRICULTURE
8094.5
8.4%

FORESTRY
822.5
0.9%

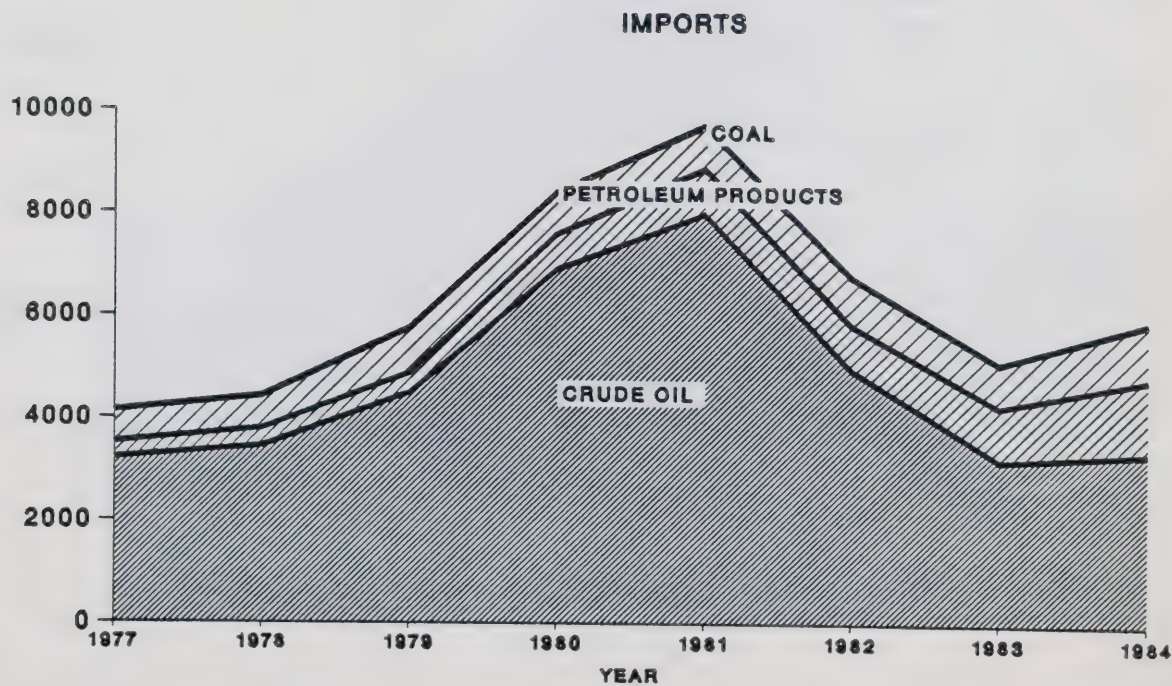
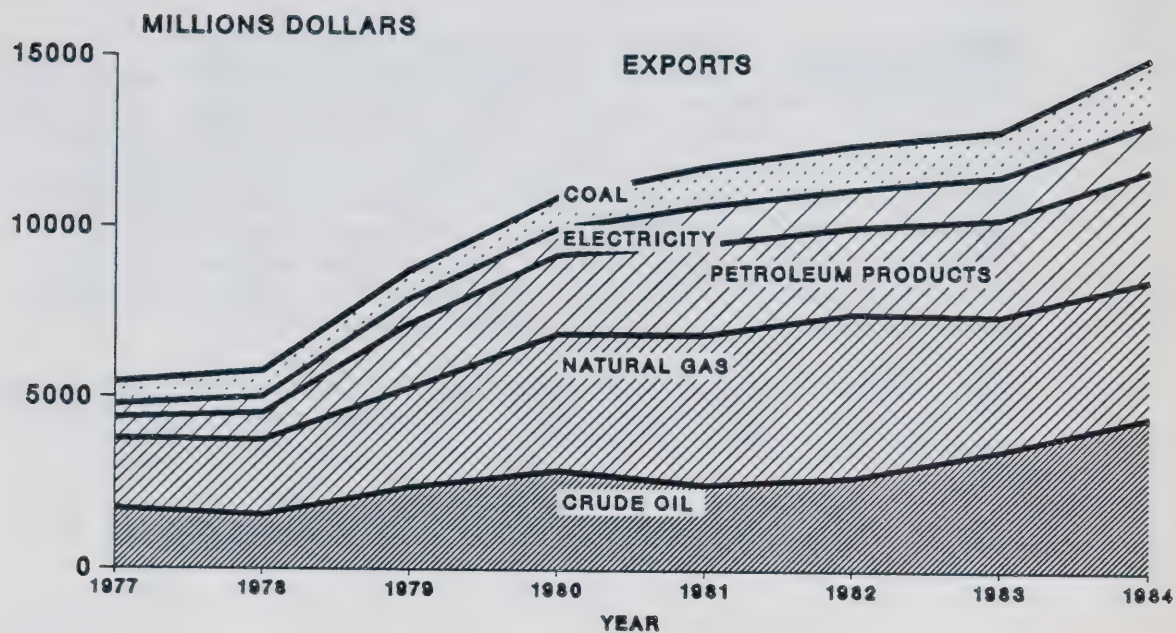
CRUDE & FABRICATED MINERALS
8340.6
8.7%

ENERGY
5925.3
6.2%

OTHERS
46949.9
49.0%



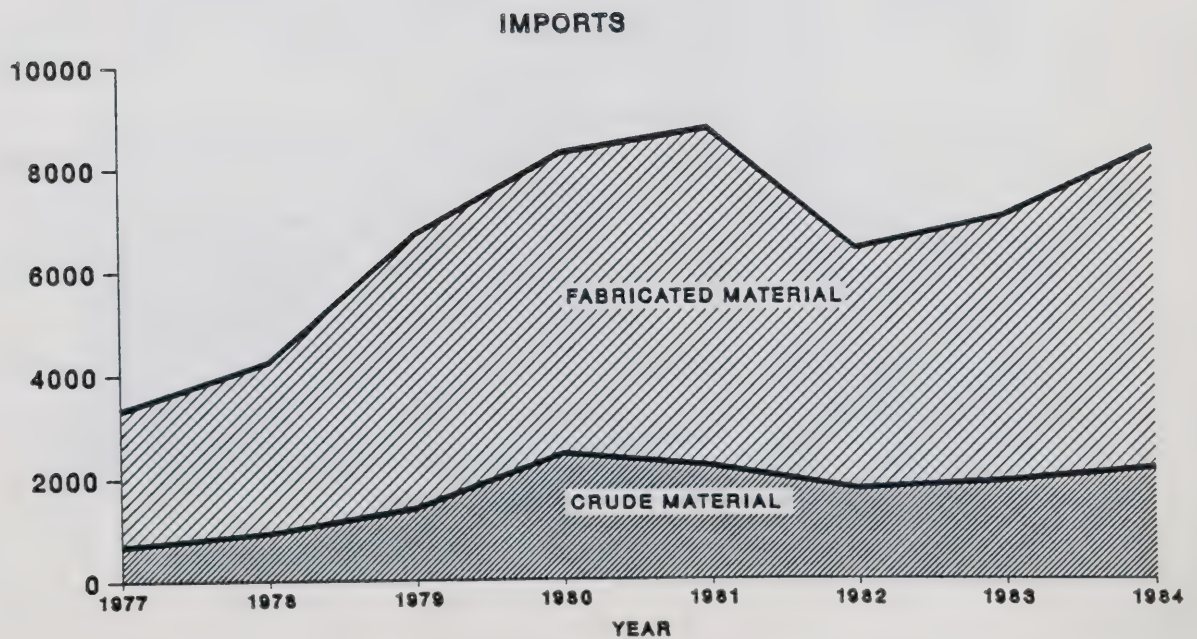
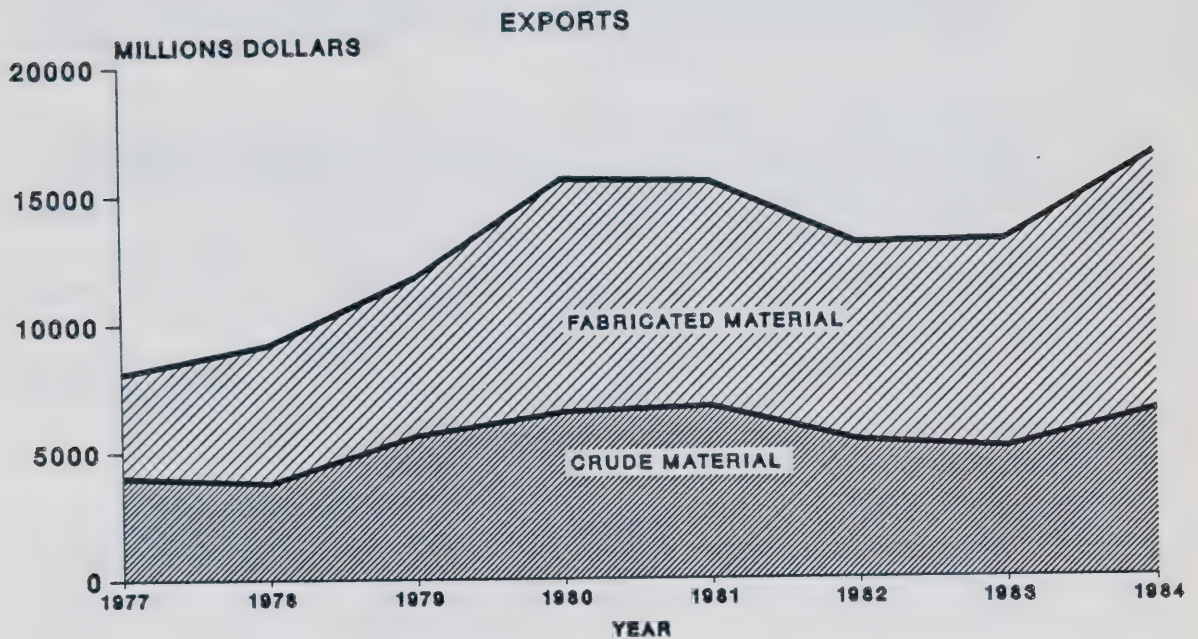
GRAPH 14 EXPORTS & IMPORTS ENERGY SECTOR



Energy Sector
Exports and Imports
1977-1984

- The energy sector has consistently since 1977 recorded a positive trade balance. The net trade balance has increased dramatically from only \$1.3 billion in 1977 to \$8.9 billion in 1984.
- Energy sector exports are dominated by crude oil and natural gas which account for 57% of energy exports. Exports of both of these commodities grew in absolute terms between 1977-1984; crude petroleum from \$1.7 billion to \$4.5 billion and natural gas from \$2.0 billion to \$4.0 billion. However, over the period 1977-1984, both commodities experienced a decline in their relative share of total energy exports. The natural gas share of exports declined from 37% in 1977 to 26.6% in 1984. Crude oil showed a more modest decline, from 32% of energy exports in 1977 to 30% in 1984.
- Petroleum products and electricity have increased their relative shares of energy exports. Petroleum products exports have dramatically increased, rising from only \$0.6 billion in 1977 or 11% of energy exports to almost \$3.2 billion in 1984 or 21.5% of energy exports. Electricity exports have increased from \$.4 billion in 1977 or 6.9% to \$1.4 billion or 9.4% in 1984.
- While crude oil is the largest export earner in the energy sector, it also accounts for the bulk of energy imports (\$3.4 billion or 57%), and makes the second smallest contribution to the positive net trade balance. Only coal, with exports of \$1.8 billion and imports of \$1.1 billion contributes less to the positive trade balance in the sector.
- The substantial increase in the value of crude oil imports from 1979 to 1981 was due the oil price increase; prices increased over 60% from 1979 to 1980 and 20% from 1980 to 1981. During this period, export volumes declined substantially as the price increased, and therefore there was not a dramatic increase in export revenues from crude oil.
- Canada does not import natural gas or electricity, therefore, the entire \$4 billion of natural gas exports and \$1.4 billion of electricity exports contribute to the total positive energy trade balance and account for 60% of the energy sector trade surplus.

GRAPH 15 EXPORTS & IMPORTS MINERAL SECTOR



Mineral Sector
Exports and Imports
1977-1984

- Since 1977 the mineral sector has recorded a positive trade balance (exports minus imports); the trade surplus increased from \$4.8 billion in 1977 to a record high of \$7.9 billion in 1984. While mineral sector exports have been greater than energy sector exports throughout the period, the energy sector accounted for a larger positive trade balance in 1983 for the first time, and again in 1984.
- Total exports of crude minerals and fabricated products were valued at \$16.3 billion in 1984, representing 14.5% of Canada's total exports. Crude mineral exports contributed \$6.4 billion or 40% of total mineral exports and fabricated mineral products contributed \$9.9 billion or 60% of total mineral exports.
- Exports of both crude minerals and fabricated products increased from 1977 to 1980, decreased moderately in 1981 and sharply in 1982. In 1983, exports were steady at the low 1982 rate, while in 1984, the decline was reversed and exports of crude minerals and fabricated products increased by \$3.2 billion to the highest level achieved in the period.
- In terms of the net trade balance in 1984, crude material and fabricated material contributed nearly equally to the sector's trade surplus, a marked change from 1977 when crude material accounted for 70% of the trade surplus. A shift to producing more manufactured products in Canada has been noted. Fabricated material exports have increased 150% over the period 1977-1984, while crude material exports have increased by 60%. At the same time, imports of crude material have increased 214%, while imports of fabricated material have increased only 134%. However, fabricated materials still account for 74% of mineral imports.

APPENDIX I-A

Definition of Energy Sector by Standard Industrial Classification Code

From Mining (Division 4)

Major Group 2 - Mineral Fuels

Sub-groups:

058 Crude Petroleum and Natural Gas Industry
061 Coal Mines

- These categories include establishments engaged in the production of crude oil and natural gas and establishments engaged in the mining of coal (including the pre-production stages).
- When upstream oil and gas is referred to in the text, the sub-group "Crude Petroleum and Natural Gas Industry" is being referred to.
- A reference to Mineral Fuels includes both oil and gas and coal mines.

From Manufacturing (Division 5)

Major Group 18 - Petroleum and Coal Products Industries

Sub-groups:

365 Petroleum Refineries
369 Miscellaneous Petroleum and Coal Products
 Industries

- "Petroleum Refineries" includes establishments which refine crude petroleum into products such as gasoline, fuel oils, lubricating oils, etc.
- "Miscellaneous Petroleum and Coal Products" includes establishments which manufacture petroleum and coal products such as roofing compounds and road emulsions.
- Where downstream oil and gas is referred to in the text, petroleum and coal products are included, along with wholesaling and retailing of petroleum products.

From Transportation, Communications and Other Utilities
(Division 7)

Major Group 1 - Transportation

Sub-group:

515 Pipeline Transport

- Pipeline transport includes establishments engaged in operating pipelines for the transportation of goods such as crude oil, natural gas, etc. The sub-group includes all pipelines, not only those which transport petroleum products.

Major Group 4 - Electric Power, Gas and Water Utilities

Sub-group:

572 Electric Power

- Electric power includes establishments engaged in the generation, transmission and distribution of electricity, owned by either governments or the private sector.

574 Gas Distribution

- This sub-group includes establishments which distribute natural gas through a system of gas mains. For example, Consumers' Gas Ltd. would be included in gas distribution while TransCanada Pipeline would be in the pipeline transport sub-group.

From Trade (Division 8)

Major Group 1 - Wholesale Trade

Sub-group:

608 Wholesalers of Petroleum Products

- This sub-group includes wholesalers of gasoline, oils and other petroleum products. It also includes establishments which deal in fuel oil, even where the end consumer is a household (e.g. residential heating oil).

Major Group 2 - Retail Trade

Sub-group:

654 Retail Gasoline Stations

- This category includes establishments which retail gasoline, oils and related products.
- Both wholesale and retail trade are included in the category referred to in the text as downstream oil and gas.

APPENDIX I-B

Definition of the Mineral Sector by Standard Industrial Classification Code

From Mining (Division 4)

Major Group 1 - Metal Mines

Sub-group:

051-059 Gold Mines, Uranium Mines, Iron Mines,
Miscellaneous Metal Mines

- These categories include establishments which mine and dress gold, uranium, iron, silver, nickel, copper, lead, zinc and other ores.

Major Group 3 - Non-metal Mines

Sub-group:

071-079 Asbestos Mines, Peat Extraction, Gypsum Mines,
Miscellaneous Non-metal Mines

- These categories include establishments which mine or recover asbestos, peat, gypsum, soapstone, talc, potash, salt and other non-metallic minerals.

Major Group 4 - Quarries and Sand Pits

Sub-group:

083, 087 Stone Quarries, Sand Pits

- These categories include establishments which quarry rocks such as granite, limestone, marble and establishments which extract sand and gravel from quarries.

Major Group 5 - Services Incidental to Mining

Sub-group:

096 Contract Drilling for Petroleum
098 Other Contract Drilling
099 Miscellaneous Services to Mining

- These categories include establishments engaged in drilling oil and gas wells and other contract drilling. Miscellaneous services include other services required for the operation and drilling of oil and gas wells and services provided to mines.

- Where upstream mining is referred to in the text, it includes the exploration, development and production of minerals and non-metallic minerals and is composed of all the major groups in the mining division (except mineral fuels).

From Manufacturing (Division 5)

Major Group 12 - Primary Metal Industries

Sub-group:

291-298 Iron and Steel Mills, Steel Pipe and Tube Mills, Iron Foundries, Smelting and Refining, Aluminium Copper and Metal Casting and Extruding

- The primary metal sector is composed of establishments which manufacture products such as pig iron, ingots, steel castings, tubes and pipes, iron castings, and which engage in smelting and refining non-ferrous metals, and manufacturing copper, aluminium and other metal bars, rods, plates, etc.

Major Group 13 - Metal Fabricating Industries

Sub-group:

301-309 Boiler and Plate Works, Fabricated Structural Metal, Ornamental and Architectural Metal, Metal Stamping, Pressing and Coating, Wire and Wire Products, Hardware Tool and Cutlery, Heating Equipment, Machine Shops, Miscellaneous Metal Fabricating

- The metal fabricating sector manufactures a variety of secondary and finished metal products such as heating boilers, structural metal for construction, sheet metal products, wire and wire products, hardware, tools and machine parts. Motor vehicle parts manufacturers are excluded from metal fabricating.

Major Group 17 - Non-Metallic Mineral Products

Sub-group:

351-359 Clay Products, Cement Manufacturers, Stone Products, Concrete Products, Ready-mix Concrete Manufacturers, Glass and Glass Products, Abrasives Manufacturers, Lime Manufacturers, Miscellaneous Non-Metallic Products.

- Non-metallic mineral products are those establishments engaged in manufacturing a variety of products from non-metallic minerals. Examples of the products are

clay tiles, cement, finished stone products, concrete products such as blocks, pipes, glass products such as plate glass, glassware and miscellaneous products not classified elsewhere.

- Where fabricated material is referred to in the text, Primary Metal Industries, Metal Fabricating and Non-Metallic Mineral Products are included.

From Trade (Division 8)

Major Group 1 - Wholesale Trade

Sub-group:

625 Wholesalers of Metal and Metal Products

- This category includes wholesalers of metal and metal products such as structural metal, bars, plates, rods, wire and metal concentrates and ores.

APPENDIX I-C

Industrial Sectors with Adjustments to
Reflect Energy and Mineral Sector Definitions

<u>Industry</u>	<u>SIC</u>
Agriculture	001-021
Forestry	031-039
Fishing and Trapping	041-047
Mineral	051-059, 071-099, 291-298, 301-309, 625
Energy	061, 064, 365, 369 515, 574, 572, 608 654
Manufacturing	101-399
<u>Less</u>	
Petroleum and Coal Products	365, 369
Total Primary Metals	291-298
Total Metal Fabricating	301-309
Transportation, Communications and Other Utilities	
<u>Less</u>	
Pipelines	515
Electric Power	572
Gas Distribution	574
Wholesale Trade	602-629
<u>Less</u>	
Wholesalers of Petroleum Products	608
Wholesalers of Metal and Metal Products	625
Retail Trade	
<u>Less</u>	
Gasoline Service Stations	654
Finance, Insurance and Real Estate	701-737
Community, Business and Personal Service	801-899
Public Administration and Defence	902-909

